



**Alex-Tronix**  
**FILTER MASTER SERIES**

# **FM-8UL**

## **Filter Backwash**

### **Controller**

### **Installation Manual**



**IMPORTANT:** Prior to use, please read manual in order to avoid system damage.

REV. 040218

# FM-8UL Installation Manual

Thank you for purchasing the Alex-Tronix FM-8UL filter controller-- manufactured in the U.S.A. The FM-8UL is our latest accommodating our digital differential pressure gauge (included), yet compatible to the Murphy switch gauge. Additionally, the FM-8UL features 'progressive backwashing' which allows every new cycle to start cleaning a different tank for better backwashing performance. Finally, the FM-8UL features an external start input for remote backwash initiation, making it easy for PLC control.

## **INSTALLATION:**

The FM-8UL's enclosure is a UL listed filter backwash controller that meets or exceeds NEMA 4X IP66 specifications. There are a few ways to install the enclosure, and must be done prior to wiring.

After unpacking, place the unit face down on a soft surface, and choose one of two mounting styles from the pictorial below. You can use 4 tabs 'E' or both braces 'D' as the enclosure's mounting support mechanism. 'D' brackets should be used if matching the mount for an existing metal Alex-Tronix enclosure. Attach mounting brackets using the provided #10 x 5/8" plastic threading screws. Fasten to mounting surface both top and bottom. See Fig. 1 below:

Ensure the unit's mount is level, and test by opening the enclosure's door by turning both catch lock knobs 90 degrees, then unsnap both catches, and swing the door open. Ensure the door opens and closes freely with no obstructions.

Using a phillips screwdriver, remove the two screws on the right side of the front panel, then swing out the front panel. The wiring terminal is now exposed, and is ready for wiring.

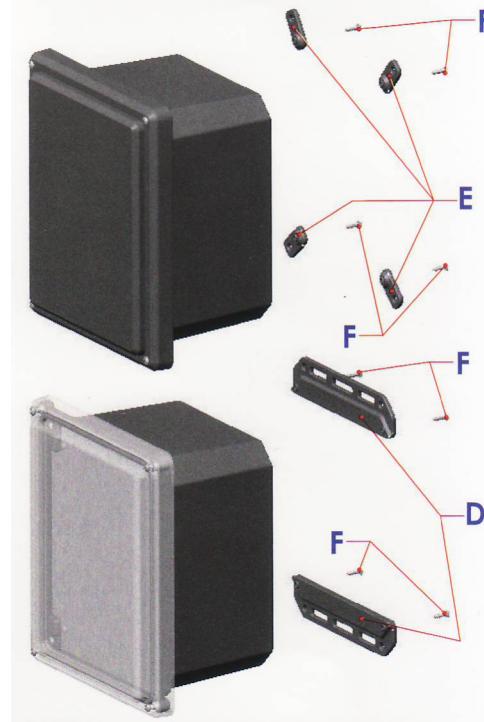


Fig. 1

**Output selector:** Prior to operating, on the rear of the main panel circuit board (bottom right), set the solenoid output selector switch to match the solenoid type you have— Compatible to: 24VAC (left position) or 12VDC or 12VDC Latching (right position) marked in white:

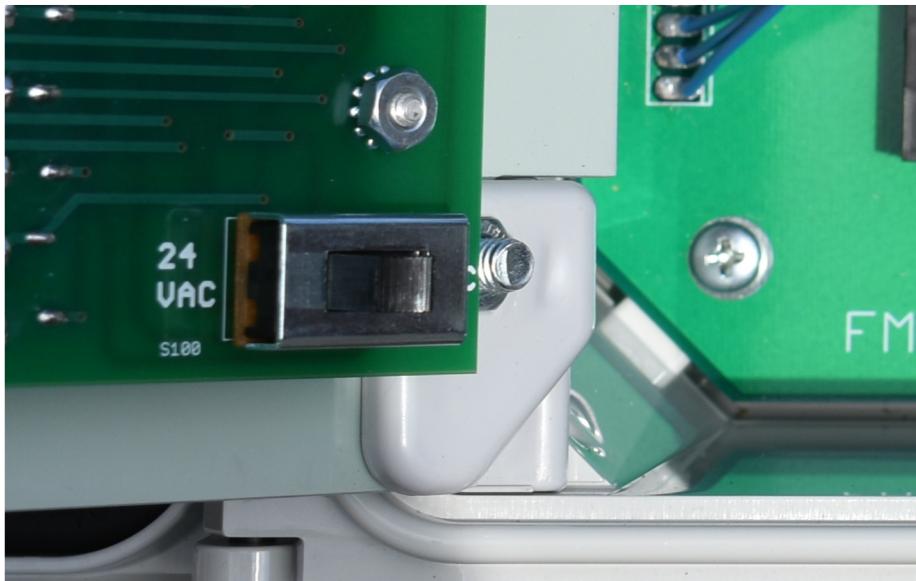


Fig. 2

**Pressure Differential Gauge:** Depending on the gauge type you have— Murphy Switch Gauge or the Alex-Tronix digital gauge, locate a mounting area either on the filter manifold, or the FM-8UL's enclosure itself (mounting bracket required for Murphy). You may require extra color coded (20-18 AWG) wire to reach controller terminals.

### **WIRING: (Refer to Figures 3-8)**

**NOTE:** Wiring must be performed by a certified electrician, and done in a manner to adhere to all local electrical and or building codes. Incorrect wiring may damage unit, and makes the unit exempt from factory warranty coverage. Safety is first priority. In order to maintain NEMA 4x rating please utilize a liquid tight and corrosion resistant conduit system. Prior to wiring, consult with local code enforcement to ensure compliancy.

### **INPUT VOLTAGE WIRING:**

The FM-8UL accommodates a single phase input voltage of: 115VAC or 230VAC @50/60HZ.

**PRIMARY SUPPLY CONNECTIONS:** A/C wiring connections are made within the primary wiring compartment (See Fig. 3). To maintain the NEMA 4x requirement, use liquid tight conduit, flexible, non metallic conduit –Type NM, LFNC-B or FNMC-B. A 1/2" conduit hub is provided (See Fig. 4). For other conduit systems, consult with local code enforcement.

Branch circuit wire must be of minimum size per NFPA requirements. A minimum of 12AWG --Type THHN or THWN is recommended.

Remove the control panel and then the primary wiring compartment cover. Connect both black and white primary transformer wires to the branch circuits **HOT** and **NEUTRAL** wire; primary transformer wires have no polarity. Next, connect the safety ground (**GREEN** wire-- attached to chassis) to the branch circuits ground wire. The transformer's secondary wires are pre-connected from the factory. Use safety listed wire nuts (not provided) for branch circuit conductors.

**FIELD WIRING:** Wire used for both solenoids and pressure differential gauge/sensor should be a minimum of 20AWG, and must comply with CLASS II low voltage wiring methods. Multiconductor cable may be used so long as solenoid wires are bundled separate from pressure sensor conductors. To maintain the NEMA 4X standard the following conduit requirements must be observed:

- Liquid tight- Corrosion resistant, made for outdoor use.
- Safety listed for suitable use outdoors.
- UV/Sunlight resistant for above ground installations.

For non NEMA 4X standard installations, use of 'gland cable fittings' recommended if conduit pipe or raceways are not used.

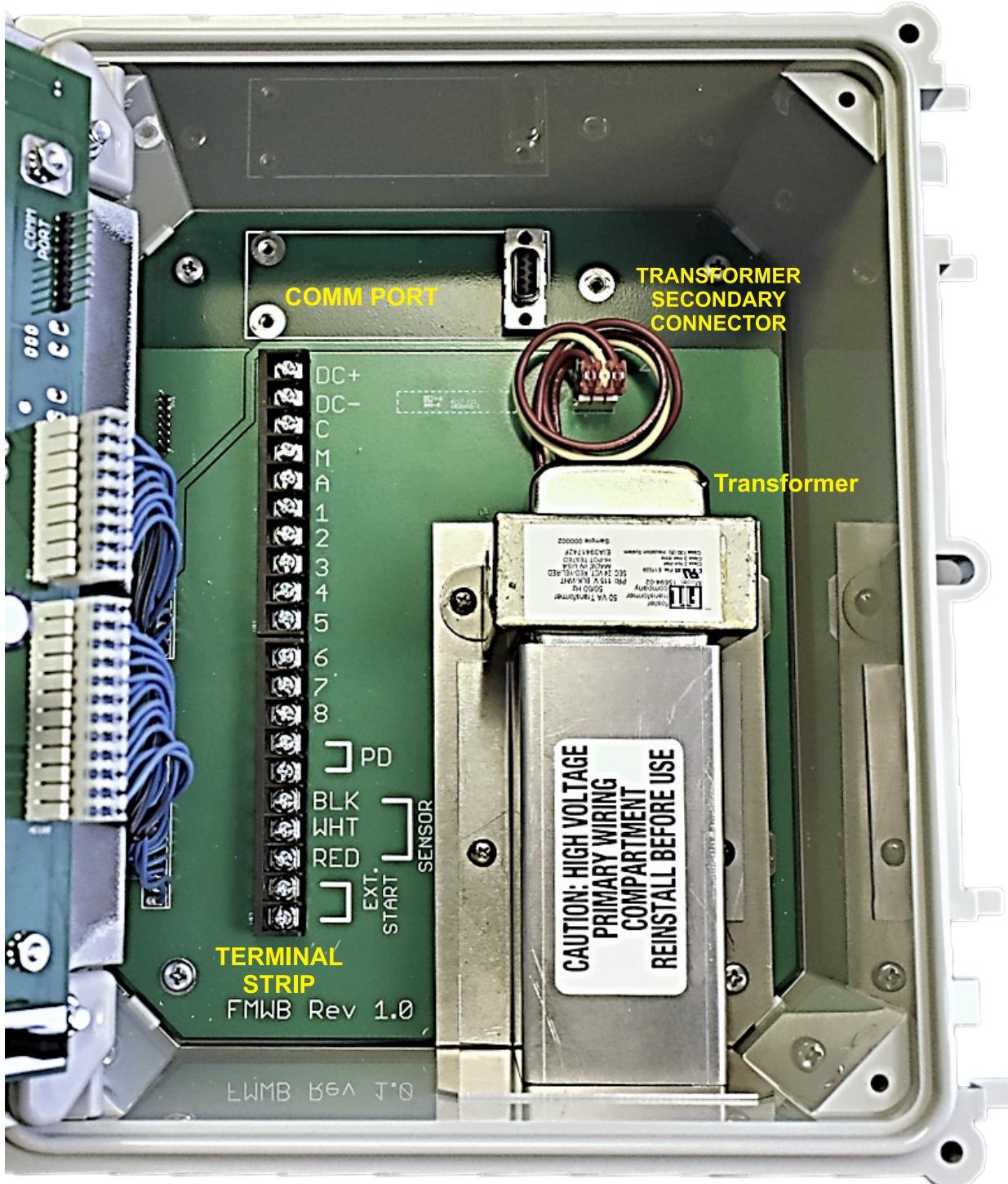
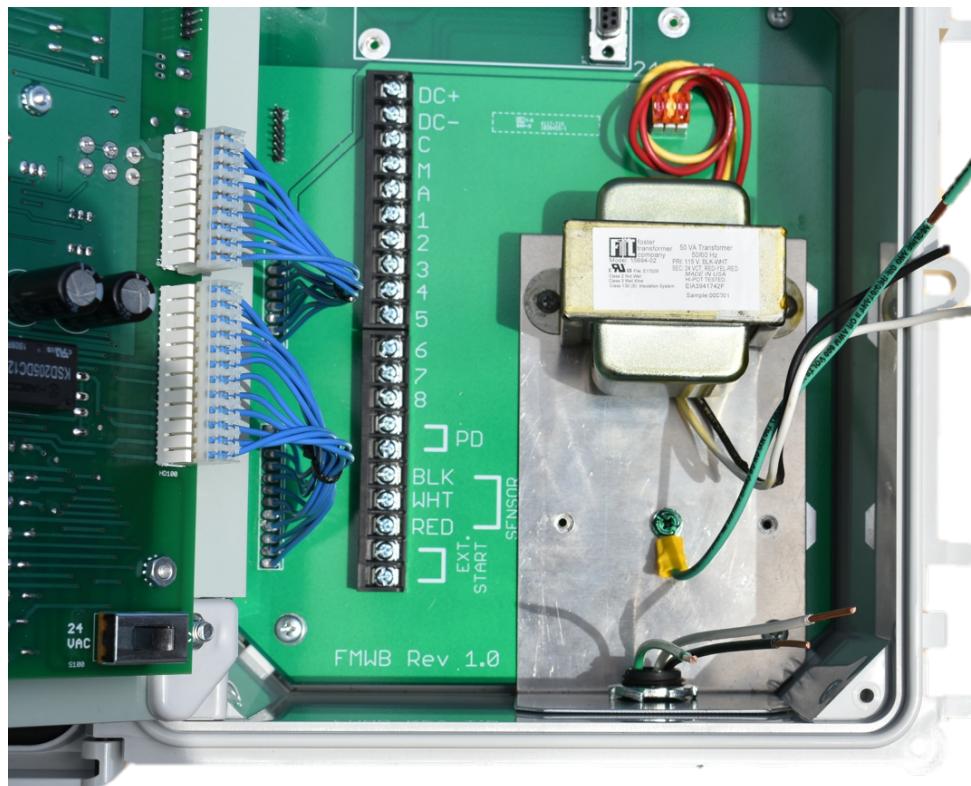


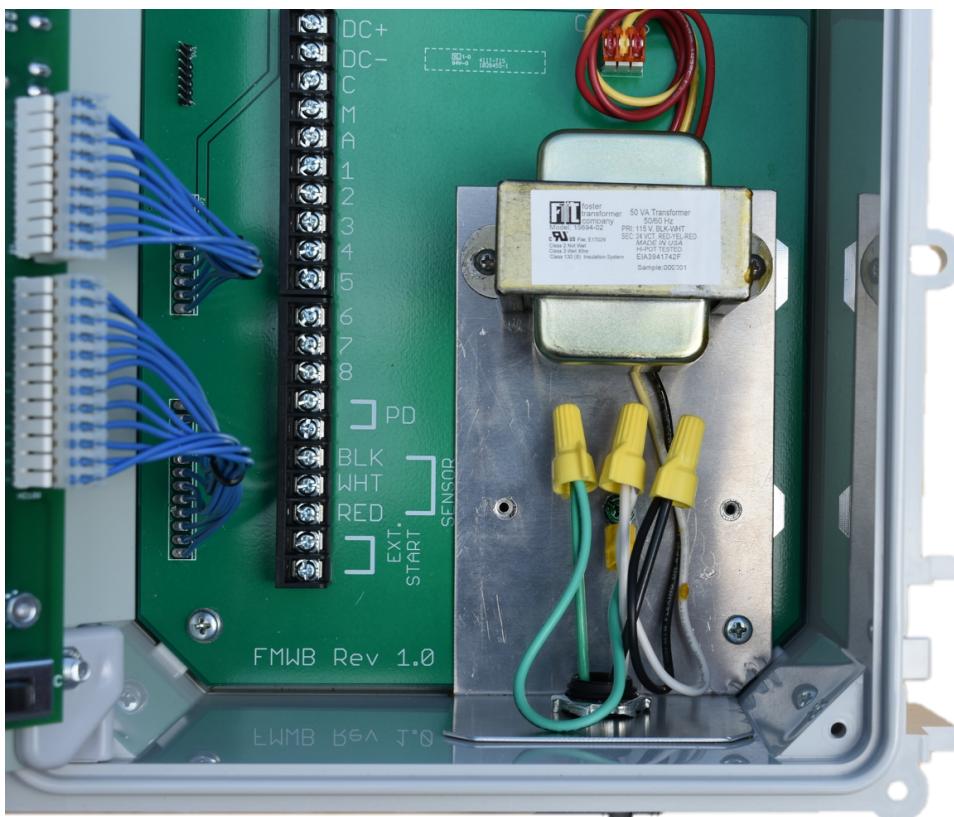
FIG 3 INTERNAL VIEW OF FM-8UL

Fig. 4



Remove Wiring  
Compartment Cover

Fig. 5



Connect Wires, Replace Cover.

## **OUTPUT BOARD:**

**MASTER OUTPUT:** This special output is used to *turn off* a field's main water valve in order to maintain sufficient pressure within the filter system for adequate backwashing. This output remains active throughout the backwash cycle and deactivates when the controller moves back to filtering mode. The output voltage corresponds to what the tank outputs are set to -- i.e. AC or DC.

**ALARM OUTPUT:** This output terminal works in accordance with the status of P.D. Gauge/Sensor, and activates when immediate, and consecutive backwashes occur. In other words, when the P.D. still remains triggered after a backwash cycle (indicating the filter system was not properly cleaned), the output will activate on the fourth consecutive backwash start cycle. When activation has occurred, "**P.D. ALARM PRESS + TO RESET**" is displayed. Press the "+" pushbutton, and the alarm output will reset, and the display clears. It will be important to know why the alarm has activated, so a filter system diagnostic should be performed to prevent any possible damage to the filter(s) themselves. This terminal may be used to drive a small lamp, alarm bell, PLC, etc., via relay. The output voltage is set according to what the tank outputs are set to -- i.e. AC or DC.

**STATION OUTPUTS:** For 24VAC or 12VDC or 12VDC latching solenoids, one wire from each solenoid all are connected to "C" (common) terminal. The remaining wires from each solenoid connect to station terminals 1-8 including "M" (master) valve if used. For latching solenoids, the same wiring scheme is followed, except note that latching solenoids *have a polarity*; all negative "-" wires are connected to the "C" terminal; the remaining positive "+" wires are connected to the station terminals, including the "M" terminal. Refer to Fig. 7 for wiring details.

**PRESSURE DIFFERENTIAL GAUGE/SENSOR:** Referring to fig. 8, this unit can function using two types of P.D. gauges -the traditional Murphy switch gauge (optional), and the new Alex-Tronix digital sensor (included). For the Murphy gauge, connect the N.O. and C on the gauge to the FM-8UL terminals both marked: "P.D.". These two connections have no polarity. Protect either gauge from freezing temperatures.

For the digital (SPD) sensor, match color and connect the wires to the three terminals: Black to "B", White to "W", and Red to "R" --noted under 'SENSOR' on the terminal strip. Tubing ports must be pointed towards the ground to help eliminate stagnant water prone to freezing within sensor. Refer to Fig. 3 for wiring details. Mount externally from controller and protect sensor from freezing temperatures.

**DO NOT WIRE BOTH THE SENSOR AND GAUGE AT THE SAME TIME.**

**EXTERNAL START:** The FM-8UL has two terminals located at the bottom of the terminal strip marked "EXT. START". These are "dry contact" control inputs, so no power is applied to these terminals. Shorting the two contact terminals can remotely initiate a backwash start irrelevant of where the function selector is positioned, and can also be repetitively triggered to move forward to the next tank. External start can be initiated by switch, or a PLC controlled relay. A minimum time of at least 100mS of switch closure is required to initiate a backwash. If the contacts remain closed, any further control actuations cease, and the unit will not respond. The contacts must open for at least  $\frac{1}{2}$  of a second and then close to move forward in backwashing the next tank. An external programmable logic controller (PLC) may be programmed to repetitively open and close the contacts to move to a specific station. A 0.5A switch/relay contact rating or higher is recommended. See Fig. 5 for wiring details.

FIG. 6 POWER WIRING CONFIGURATION.

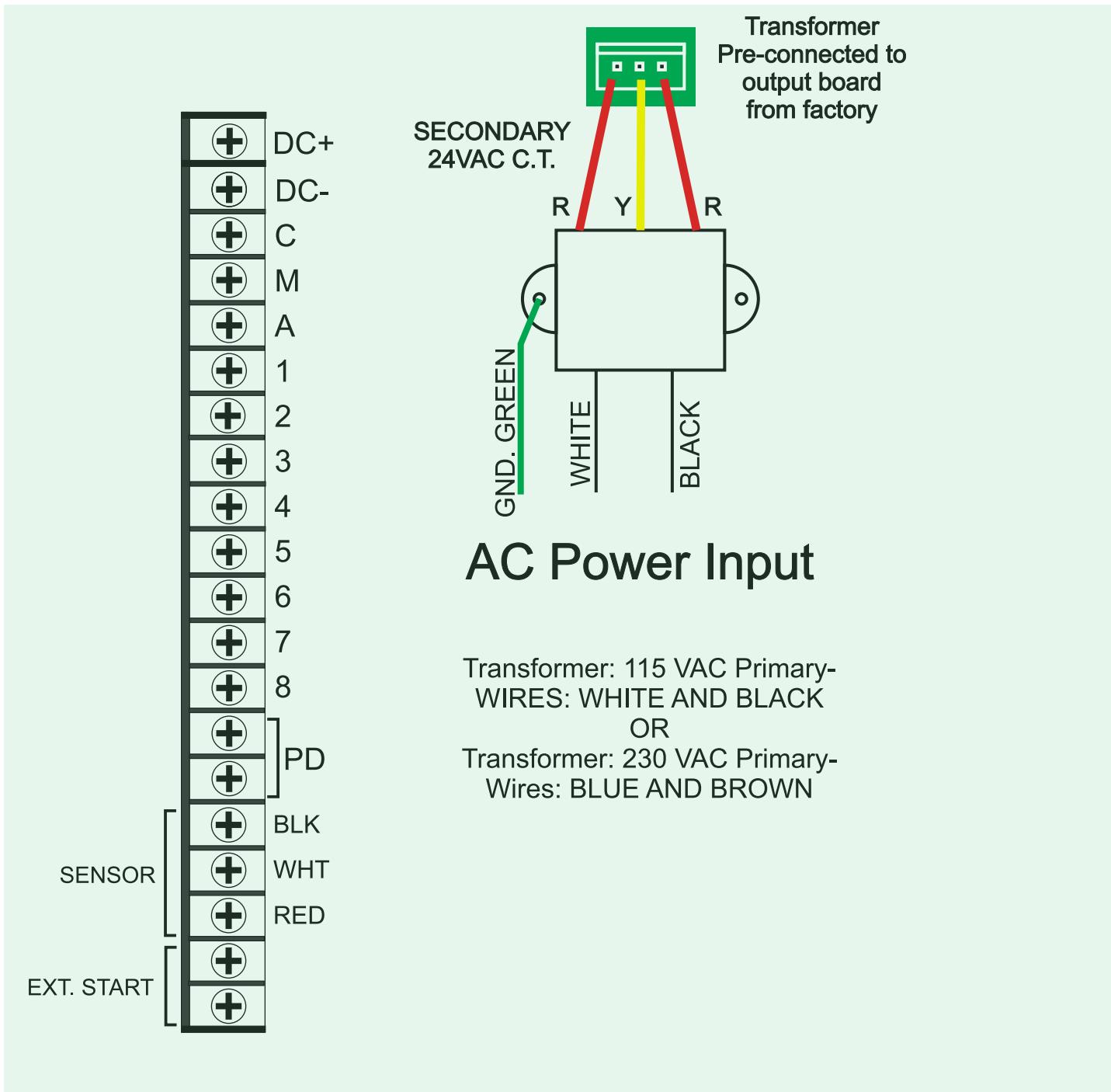


Fig. 7 - Solenoid Wiring

A/C solenoids will most likely have differing wire colors.

Master (M) and Alarm (A) Any alert device must be same voltage as output selector setting.

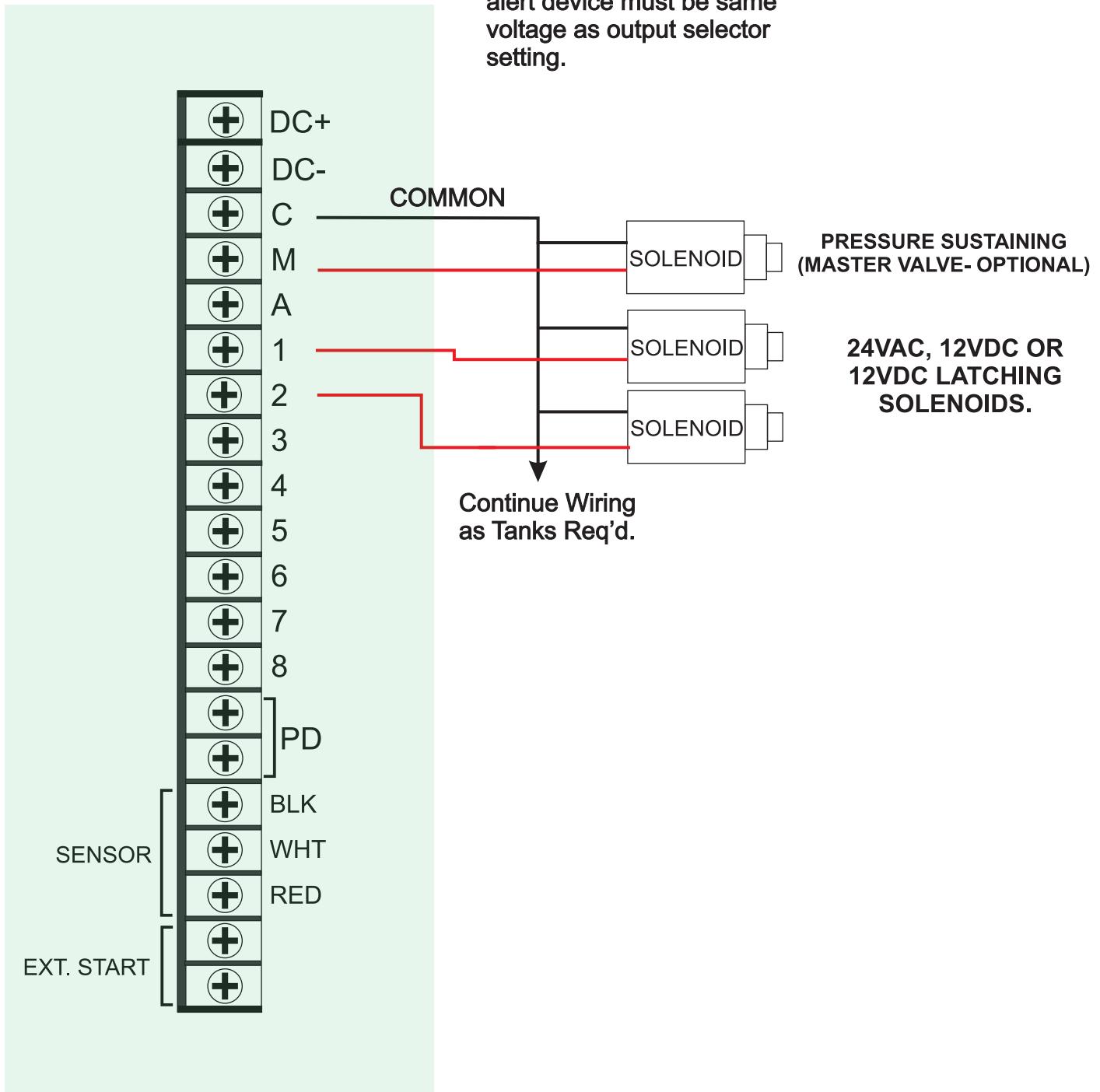
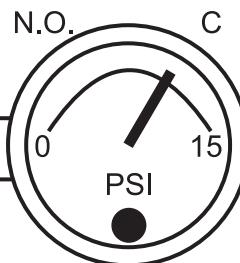
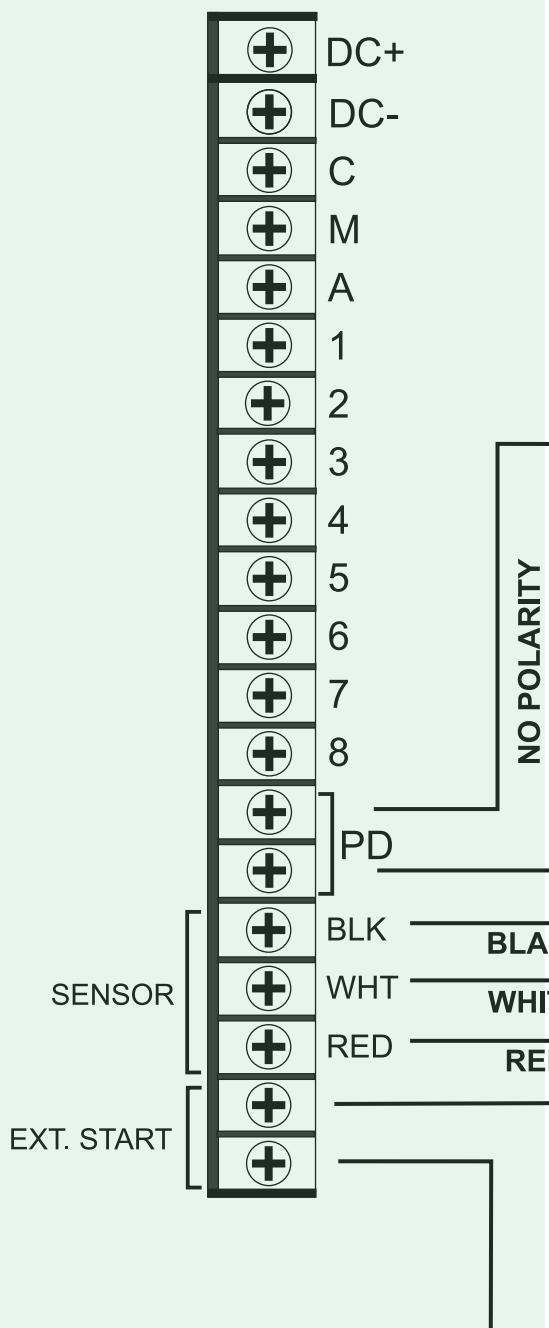


Fig. 8 -- Sensor or Gauge Wiring

**CAUTION: DO NOT USE BOTH GAUGE TYPES AT THE SAME TIME.**

**BOTH SENSOR AND GAUGE MUST BE PROTECTED FROM FREEZE.**

Both gauge and sensor externally mounted.



"MURPHY" SWITCH GAUGE  
(OR ANY PRESS. DIF. SWITCH)

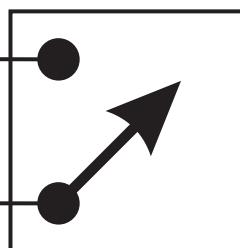
**OR**



ALEX-TRONIX (SPD) DIGITAL  
DIFFERENTIAL PRESSURE GAUGE  
TUBING PORTS MUST BE POINTED  
TOWARDS THE GROUND.

Auxiliary External Start Relay/  
Switch Used to Initiate Backwash.

>0.5 AMP  
Contact Rating



## **ELECTRICAL SPECIFICATIONS:**

INPUT: 115/230 VAC 50/60 HZ 46VA

OUTPUT: 24 VAC 1.6A OR 12 VDC 2A

For any questions or help regarding the installation of this controller please contact us at 1-888-224-7630. For questions regarding your filter system, contact the manufacturer.

### **ALEX-TRONIX --A DIV. OF GNA INDUSTRIES, INC.**

4761 W. Jacquelyn Ave., Fresno CA. 93722

TEL: 559-276-2888 FAX: 559-276-2890 Toll Free: 888-224-7630

[www.alextronix.com](http://www.alextronix.com)

### **WARRANTY**

Suppliers and end users of this product agree to the following terms, conditions and limitations of warranty and liability coverage:

Alex-Tronix warrants the FM-8UL to be free from original defects for two years from the date of original sale. The manufacturer shall replace, free of charge any part found defective under normal use and service within the guarantee period, provided the product is installed, used, and maintained in accordance with any applicable instructions or limitations issued by Alex-Tronix. Components supplied replacement parts are warranted for 90 days from the date of shipment. The manufacturer assumes no liability for incidental or consequential damage sustained in the adoption or use of our engineering data, service, or products. Liability is therefore limited to the repair of the product manufactured by Alex-Tronix. No agent or representative of Alex-Tronix has the authority to waive or add to this agreement. Altered products, or use of products in a manner not intended shall void this warranty. For warranty service, ship unit pre-paid to the address below. Controllers damaged in transit due to improper packaging are not covered by warranty.

For warranty repair, send defective product freight pre-paid to:

Alex-Tronix Controls Div. GNA Industries - 4761 W. Jacquelyn Ave. Fresno, CA. 93722 - Tel: (888)-224-7630 Fax: (559) 276-2890  
[www.alextronix.com](http://www.alextronix.com) - [orders@alextronix.com](mailto:orders@alextronix.com)